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The Forests of California.

WE begin this week the publication of a series of articles upon forestry, in its relation, principally, to the natural conditions of our Pacific coast. They are from the pen of Mr. Abbot Kinney, the President of the Forestry Commission of the State of California, whose opportunities for studying the actual condition of the California forests and the attitude of the people of that State towards them have been exceptional.

Perhaps nowhere in the world—certainly nowhere on this continent—is the preservation of the forests so important to the welfare of the entire population as it is in California. The physical conditions of the State are peculiar. It is made up of two mountain ranges running parallel with the coast, and inclosing a long, narrow valley, with many smaller, lateral valleys. The rainfall of the year is irregularly distributed, and is entirely wanting during the summer months, so that artificial irrigation is essential for many crops of the field, the orchard and the garden. The water for artificial irrigation must be brought from the mountains, where the snows of the previous winter, melting slowly under the protecting shadows of the forest, afford a constant and sufficient supply. If the forests which cover the mountains are destroyed the snow will melt more rapidly than it does at present, and the water will seek the valleys, not gradually, but suddeniy and rapidly. The result will be that the water essential for irrigation will be wasted, and that the short rivers of California, with their precipitous beds, will be converted into torrents every spring and summer, and will gradually carry the soil and the rocks from high mountain-slopes down into the valleys, which, sooner or later, will be buried past redemption.

The future prosperity of California—the very existence of the State—is dependent, therefore, upon the forests which clothe her mountain-sides. These forests are still, in large measure, the property of the general government, and it is within the power of Congress to take measures for their protection. The disregard of the people of California for the property of the national government in that state, and for their own future prosperity, is a matter of notoriety. Year after year vast herds of sheep and cattle and horses have been driven from the valleys at the beginning of the dry season to feed in the mountain forests. Long ago they stripped the forest-floor bare of every particle of vegetation, except the thorny chapparal bushes, and devoured every seedling tree. The sharp hoofs of sheep and goats have cut out the roots of perennial plants and worn deep, narrow paths across the mountain-sides, down which water can pour unchecked to the rivers. But this is not the only danger which the pasturage of the nation's forests in California has inflicted. As grass and bushes disappear from over-feeding, the shepherds set fires in the woods to burn away the trees, and so increase the pasturage area. The smoke of hundreds of fires may now be seen from any of the high Sierra summits, and it is merely a question of time, under existing conditions, when these forests will have disappeared forever. For forests do not reproduce themselves as easily in the dry climate of western America as they do in all the Eastern States; and if these mountains are once stripped of their tree covering, and the soil is allowed to wash away, their restoration will be the affair of centuries.

The commercial value of the California forests, although secondary to their mechanical value as reservoirs of moisture, is still very considerable. The Redwood forests, to be sure, are doomed, and no action of the general government or of the state government can be made operative soon enough to save them from extermination. The quantity of redwood which remains is comparatively small, the forests are too easy of access, and their product too valuable to make preservation possible, even if the people of California could be made to see the necessity for action in this matter. The Redwood belt of California contained, for its size, thirty years ago, by far the most valuable body of soft timber in the world; in less than thirty years more, Redwood trees of large size will be as rare and as great curiosities as the giant Sequoias are today, and California will have lost her most valuable inheritance.

High up on the slopes of the Sierras, however, there are immense quantities, in the aggregate, of sugar pine still remote and inaccessible, which the general government might well attempt to save for future use when the white pine of the east, the cypress of the south, and the redwood of California have all disappeared before the recklessness of American methods. For in the Sugar Pine belt of the Sierras will then be found their only substitute, not in quantity, but in the quality of the material it can furnish.

If the general government of the United States ever makes the attempt to protect the forests which are found upon the national domain, it is in California that the experiment should be begun, because in California the forests are more essential to the welfare and development of the state than in any other part of the country.

The proper use of herbaceous plants, with more or less showy and conspicuous flowers, in the adornment of parks or of lawns—that is, outside of the flower-garden proper, in which such plants are the most useful and attractive feature—is a matter requiring much judgment and skill in the selection and in the use of material. Indeed, there is no form of planting, perhaps, which is more difficult to master, and which is, within certain limits, at least, more disastrous in effect when it is not well done. That this is not an exaggerated statement, an examination of the attempts which have been made in recent years to introduce these plants into the Central Park in this city, or in the Fens in Boston, will show. Clumps of the Funkia or Day Lily, in itself a beautiful plant, well suited to the flower-border, for which its round and formal mass of foliage well adapts it, placed in front and in connection with loose masses of deciduous shrubs in the Central Park, produce the worst effect, destroying simple sweeps of turf and all idea of naturalness, while the spotting about of single plants of Pæony and

other garden plants in front of shrubs, or often in the lawns at a considerable distance from shrubs, detracts from rather than adds to the beauty of the park. Indeed, it would be vastly benefited if all such inharmonious elements were cleared away and greater simplicity and naturalness allowed to prevail. All such plants are clearly out of place outside the flower-garden. In the Fens, as a part of the new Boston Park system is called, where the attempt is made to connect a salt marsh with the roadway surrounding it, by means of slopes planted in imitation of nature, the effect has been curiously marred by the introduction among the shrubs of great numbers of showy flowered perennials—garden Phloxes, Carpathian Harebells, great masses of brilliant Monardas, Yuccas from the sandy fields of the South, and many more incongruous and inharmonious plants, which seem curiously out of place on the margin of a New England salt-marsh.

There are herbaceous plants, however, which, if used with discretion, can be made to add to almost any landscape, however natural its motive or simple its composition. We have already pointed out in these columns how several varieties of bulbous plants can be used naturally on the margins of woods and shrubberies with the most charming effects, but there are many more robustly growing plants, especially among those which flower at this season of the year, which, if used sparingly, in connection with shrubbery, can be made to play an important part in the decoration of parks. Those herbaceous plants which, when fully grown, approach shrubs in outline, are the best for this purpose, and generally can be used with safety in connection with shrubs. The Flora of North America abounds in such plants—perennial Sunflowers, Silphiums, Rudbeckias, Vernonias, Asters and Golden Rods. No country in the world possesses so many handsome plants of this sort as North America, but they are little known yet except by a few botanists, and their really great decorative value is not appreciated. There is nothing in the habit of such plants which jars upon the most refined taste when they are planted among shrubs, while their flowers, which appear long after those of nearly every shrub have disappeared, light up the shrubbery brilliantly. Even these plants, however, should be used cautiously and never in great masses, in connection with shrubs. A shrubbery in the United States in late September on the borders of which are blooming, just in the right places, a Silphium and a Vernonia, a Sunflower, or one of the great Rudbeckias, is an object not easily forgotten.

August in the Pines.

IT is late in August, and waning summer has held some of her choicest floral treasures until now. On the borders of a pond stands the handsome *Sabbatia chloroides*, its loose panicles of deep rose-colored flowers showing to best advantage against the delicate green of the grasses and sedges about it. Two other species of Sabbatia are near by—*S. lanceolata*, which has a flat panicle of white flowers, and *S. stellaris*, with rose-purple corollas almost as beautiful as the first mentioned; the flowers, however, are smaller.

And here among the grasses is the rare *Coreopsis rosea*, with yellow florets and rose-colored rays. *C. lanceolata* is also here, with bright yellow flowers, and rays an inch or more in length. Both species are not only beautiful here, but they will help to brighten any garden, for they take kindly to cultivation.

The pretty Mist-flower (*Conoclinium cælestinum*) is just coming into bloom. Its corymbs of blue flowers are as fine as any of the garden Ageratums, which it closely resembles. The climbing Hemp-weed (*Mikania scandens*), with flat corymbs of pale pink flowers and halberd-shaped leaves, is twining over bushes, and hanging out from the main plant are many graceful, drooping sprays swaying in the wind.

The bright orange flowers of *Polygala lutea* are more abundant this month than last. These, together with the Mist-flower and sprays of the climbing Hemp-weed, form a charming combination for house decoration.

Our Pine-barren Gentian (*Gentiana angustiflora*) is just beginning to open its lovely, blue, funnel-shaped flowers. The corollas are two inches in length and quite open. It is almost as pretty as the Fringed Gentian—the queen of these flowers—which has a wide range from New England to our Barrens, and probably further south.

The Shell-flower (*Chelone glabra*), which also has a wide range, finds a home in the Pines, and its companion, the Monkey-flower (*Mimulus ringens*), is here, too. The Purple Gerardia is abundant among the grasses, and is one of our beautiful plants that does not make itself at home in gardens.

Tall plants of the large, showy Rose-mallow (*Hibiscus Moscheutus*), with corollas six inches or more across, are standing like sentinels over their more humble neighbors. Some of the flowers are white with a crimson eye; others are pink and rose-color. The plants and flowers are larger and more stately than the Hollyhocks of our gardens.

Many shrubs and trees are beautiful now in their mature leaves and fruit. *Magnolia glauca*, with its shining, glossy leaves, and red, cone-like fruit, is more handsome now than when in flower. The leaves are perfect, neither insect nor fungus have marred their beauty, and nothing can be more charming for house decoration in large vases than small branches of this Magnolia, with the central fruit surrounded by the rich foliage. The leaves of the Sumach (*Rhus copallina*) are also of the deepest shining green. They have not yet taken on their rich, autumnal tints, and are as perfect as the Magnolias—neither moth nor rust hath corrupted them.

The treacherous poison Sumach (*R. venenata*) is holding out its tempting, beautiful foliage. To many persons it is harmless, but to me it is a virulent poison, and I cannot restrain a cry of fear as I come suddenly upon it, whereupon a boy near by, who is catching frogs, calls out: "'Tain't pizen; I have eat it lots o' times," and then he pulls off a handful of leaves and vigorously chews them. On expostulating with him he clinches the argument with, "I *know* 'tain't pizen. Pop says it won't pizen a chicken." And with lofty scorn for my terror, he continues to chew the leaves so harmful to me, while pursuing his amphibious game.

The Pine-barren Sunflower (*Helianthus angustifolius*), with narrow, long, almost grass-like leaves, is in bloom. This is a very marked and distinct species, and I have never noticed that it hybridizes with any of the other Sunflowers. Some of the plants are six to seven feet in height, full of bloom and very attractive. It does fairly well in cultivation.

Passing from the damp Barren to the dry, sandy woods, I find the Yellow Gerardias (*G. flava* and *G. quercifolia*) in flower, with inflated tubes somewhat of the form of our garden Foxgloves. Fine plants of *Rudbeckia fulgida* are also in bloom, which are always attractive, with their bright, orange-yellow rays, and dark, rounded disks. And here, too, is the Golden Aster (*Chrysopsis Marianna*) and the showy Double-bristled Aster (*Diplopappus linariifolius*), with numerous violet rays and many narrow leaves along the entire length of the stems.

The Blazing-star (*Liatris scariosa*), with long spikes of rose-purple flowers, commands our attention by its erect and stately bearing, while in contrast with it, the Rattlesnake-weed (*Hieracium venosum*) holds its rosette of leaves, which are beautifully veined with purple, close to the ground. From the midst of the leaves rises a slender, naked stem, which branches at the top into a loose corymb of pale yellow flowers.

Away back from cultivated ground, by the side of an old, deserted, nearly obliterated wagon-road, is the Pimpernel, or Poor Man's Weather-glass (*Anagallis arvensis*),

claiming a place among our flowers, and the wonder is how it ever came here. But it is closing its pretty, scarlet flowers, telling us that rain is coming and that our ramble must end. *Mary Treat.*

Vineland, N. J.

Foreign Correspondence.

London Letter.

Olearia Haastii.—This New Zealand composite shrub is now among the most attractive ornaments in English gardens, for of late years it has been used largely in gardens, large and small. A few years ago one could only see it in botanical collections, but, since it has proved hardy everywhere, the wholesale nurserymen have taken it in hand, and it has become diffused throughout Great Britain. In a garden in Kent I have this week seen enormous bushes of it completely whitened with its small Daisy-like blossoms. In one case it was quite seven feet high and as many across. When large it is not such a compact bush as when only a yard or so high, but its leggy growth can be corrected by hard pruning in spring. It is a capital evergreen, and one that stands a smoky atmosphere well, and is therefore much used now in town-gardens. I do not know how many degrees of frost it will stand, but during the severe cold in 1879 and 1880, and also last year, it was unscathed with the thermometer at +12°. I imagine it is hardy enough to endure the winters of your Middle States. Small plants are used with fine effect for lawn-beds, mixed with some bright-colored plant that flowers at the same time, such as *Gladiolus Brenchleyensis*, whose brilliant scarlet spikes make a fine contrast with the white blossom. When out of bloom it reminds one of the Balearic Box.

Salvia azurea grandiflora, which goes also by the name of *S. Pitcheri*, is one of our most useful green-house flowers in summer, and is now in perfection. It is an easily grown pot-plant, or it may be planted in the open border, though it is liable to be winter killed sometimes. We have nothing to compare with this Salvia when in perfect bloom. Its spikes of bloom, of the richest azure-blue, are often six inches or nine inches in length, and as the flowers open in succession the plant is attractive for weeks. The plants may be kept from year to year, but early spring-struck cuttings make fine flowering plants by summer, and are more vigorous and flower freer than old plants. Some very charming effects may be produced in the green-house by grouping this Blue Sage with some graceful white-flowered plant, such, for instance, as *Francoa ramosa*, which flowers at the same time. As this Salvia is not mentioned in Gray's Manual, I presume it is a native of Mexico, hence its tenderness. [*Salvia azurea*, var. *grandiflora*, is a native of the south-western States from Mississippi to Kansas, Colorado and Texas.—ED.]

A good garden Rose is one called The Pet. It does not grow more than a couple of feet high, makes a wide-spreading mass of shoots, clothed with broad, deep-green foliage, and every shoot terminates in a huge cluster of small white flowers, which, in a bud stage and till half opened, are of a delicate rose pink. It is becoming a great favorite in English gardens, as it is found so useful for cutting.

Lilium auratum is exceptionally fine this season when planted in light soils. The long continuance of heavy rains seems to have suited it wherever the superfluous moisture could drain away quickly, but in heavy soils, even where special lily-beds are prepared, it has been a failure. It is very impatient of stagnant moisture at the root; on the other hand, a moist atmosphere seems to favor a strong growth. In Kew Gardens, at the present time, this Lily is magnificent, intermixed with Rhododendrons in a deep, peaty soil. In many cases the stems are six feet high, as thick as a broom-handle, and bear enormous heads of flowers, many of them fasciated. The finest varieties, too, of *L. auratum* have showed well this season. I saw, the other day at Veitch's, the splendid variety named Platyphyllum, which has leaves twice as long and broad as the type, and with flowers nine inches across, with a broad band of gold down the middle of each petal. The variety Cruentum, or, as it is often called, Rubro-vittatum, I have seen very fine lately in several gardens. The broad band of crimson which runs through each petal of white renders it an extremely showy plant. All Lily-growers on this side, by the way, are anxiously awaiting the time when Parkman's Lily (*L. Parkmani*), a magnificent hybrid between *L. auratum* and *L. speciosum*, will be obtainable by purchase. When I was at the Knap Hill Nurseries last (Mr. Anthony Waterer holds the entire stock of this Lily) I was told that it would be distributed soon. The stock looks very strong and it seems to be a very robust grower. Your readers may not all know that Parkman's Lily was raised by Mr. Francis Parkman, the historian, twenty years ago. It has flowers a foot across, in shape like those of *L. auratum*, and every petal is a brilliant crimson, broadly edged with white and with a gold band down the centre of each. Other Lilies will be envious when this one appears.

A Hardy Banana is an interesting novelty. It is a species of Musa from Japan, growing in the open air in Messrs. Veitch's nursery, and is likely to prove perfectly hardy in England, inasmuch as it has withstood the frosts of the past few seasons with but little or no protection. It has as large leaves as the common Banana, but its growth will, I think, be more like that of the Abyssinian Banana (*Musa Ensete*). The value of a hardy, noble-leaved plant cannot be overestimated, for with it our gardens, without much cost or trouble, may be made to assume a sub-tropical aspect. *Wm. Goldring.*

London, August 18th, 1888.

New or Little Known Plants.

Deutzia parviflora.

THE fine Deutzia of which a picture appears upon page 365 of this issue, although but little known in gardens, yet is by far the most beautiful of the three or four species now cultivated. It is a native of northern China and the Amoor country, and was sent a few years ago from the St. Petersburg garden to the Arnold Arboretum, whence it has found its way into a few of the principal collections of the United States.

Deutzia parviflora is a stout shrub, with upright stems four or five feet high, covered with exfoliating brownish yellow bark, and sharply serrate, dark green, elliptical or lanceolate leaves, which are pale and conspicuously reticulately veined on the lower surface. The corymbs of handsome white flowers appear here generally during the first week of June, and are produced in the greatest profusion, quite covering for several feet the upper portions of the stems. Maximowicz, in his revision of the genus Deutzia, describes nine species. They are all Asiatic, three belonging to the temperate Himalaya region, two to northern China (of these the large-flowered *D. grandiflora* should be a real acquisition in gardens) and four to Japan. There is a very complete analytical drawing of *D. parviflora* (*t.* iii., Figs. 18–32), in Maximowicz's Revision, published in the tenth volume of the *Mémoires de l'Académie des Sciences de St. Pétersburg*, 7me série, x, and it has been figured by Regel in his "*Flora Ussuriensis*" (*t.* v., figs. 7–14) and in the *Gartenflora* (1862, *t.* 370).

It is one of the hardiest and most desirable of the Asiatic shrubs of recent introduction. *C. S. S.*

Cultural Department.

The Species of Gladiolus.

THE genus Gladiolus, as at present defined, includes about ninety species. The latest authoritative review of the family to which the genus belongs is in the "*Genera Plantarum*" of Bentham and Hooker, and this differs considerably from Mr. Baker's in the sixteenth volume of the "Journal of the Linnean Society," under date of 1878; and as we go backward along the line of botanical literature we find very great variety and even confusion of views as regards the genus. Species of Ixia, Anomatheca, Watsonia, Acidanthera, Tritonia, Babiana, etc., have been considered Gladioli by various authors, and many now called Gladioli have been previously referred to Homoglossum, Watsonia, Geissorhiza and other genera.

The genus is somewhat widely dispersed. Though by far the greater number of species are South African, one, *G. Illyricus*, strays as far to the north and west as the New Forest in England, and others are found on the Mediterranean coasts and islands and as far eastward as Persia and Afghanistan. A few occur on the western coast of tropical Africa and a few on the eastern, while three or four are indigenous to Madagascar.

This wideness of range indicates great dissimilarity of constitution and requirements among the species; accordingly we find some that flourish with vigor under cultivation and others that die away in spite of all our pains; some that will endure, unprotected, the rigor of a New England winter and

others that will tolerate no frost at all. As the hardiness of a plant, however, does not depend upon temperature alone, the native country of a species affords no sure indication of its ability to withstand severe cold.

The species of the north temperate zone are not, as a class, as showy as the tropical kinds; yet, in their way, they are very beautiful, and, as far as I have tried them, perfectly hardy. According to Baker's enumeration there are fourteen of these and several well-marked varieties. Few of these are in cultivation, though some of them are very desirable, especially the purplish blue *G. Kotschyanus* of Persia.

I find that *G. Byzantinus*, *G. communis* in its three varieties, *G. imbricatus*, *G. Illyricus*, *G. segetum* and *G. triphyllus* withstand the cold of our winters very well, though the last named, a Cypriote species, is a little tender unless in well drained soil and even then it is better for a covering of leaves. It will be found, indeed, that all of these kinds will do better with some protection; and, in fact, without it will increase very slowly, if at all.

The African species are the most satisfactory for horticultural purposes, being, in the main, more beautiful than the others and generally very easy of cultivation. A few of them attain the height of stalk and something approaching the size of flower of the gorgeous garden hybrids so generally cultivated under the name of *G. Gandavensis*.

The following species are best treated as the hybrids just mentioned; that is, planted in the open ground in May and taken up again in October. They may be kept in boxes in a cellar where the winter temperature is about 40° Fahr.

G. purpureo-auratus.—This is a native of Natal. It has stiff, narrow and somewhat glaucous foliage, and a slender but rigid flower-stalk about three feet high. The flowers are from six to ten, of a peculiar shape, the upper segment being curved over like a hood. They are not large, an inch and a half being the average breadth, and are yellow, with blotches of a color between crimson and purple. The ground color is by no means as strong and pure a yellow as in the figure in the *Botanical Magazine* (*t.* 5944), but rather somewhat greenish. This species is likely to be better known in its offspring than in its own person, for it is one parent of the "Lemoine hybrids," so-called, which are remarkable for their vivid blotches and their peculiar shape; both of which characteristics are derived from the species under consideration.

G. purpureo-auratus seldom seeds from the influence of its own pollen; such, at least, is my experience, for though I grow a great many every year in one mass, from the seed of which I have raised many hundred plants, I have never had but two seedlings which did not show the influence of the Gandavensis varieties growing near them. This species forms a great many bulblets which lie a little way from the old corm, to which they are joined by short connectives. They have a thinner coating than those of the Gandavensis sorts and start into growth more readily. This is the hardiest of the African species. I have known it to come up for several years among the grass in a mowing-field.

G. floribundus.—This is a very pretty low-growing kind, bearing from ten to twenty blush-white flowers on a stem about eighteen inches high. These are never fully open as we are accustomed to see Gladioli, but retain a half-closed appearance. They are usually somewhat crisped along the edges.

G. cardinalis.—A very brilliant scarlet and white species of low stature and great beauty. The bulbs of this, as well as of the hybrids of which it is a parent, viz., *G. Colvillei*, *ramosus*, *pudibundus*, *candidus* and *incarnatus*, will not endure being kept long out of the ground; at the same time, if left in the soil late in the summer they will make an autumnal growth to which the winter will be fatal; they ought, therefore, to be lifted a month after flowering and replanted in October either in a frame or in a raised bed of earth with a thick covering of leaves.

G. cruentus.—This is a magnificent species from Natal. Its manner of growth is very peculiar, for, while many kinds may be put into the ground on their sides or tops, as well as on their bases, the shoots arising perpendicularly from the soil, the shoots of this species appear to grow straight away from the centre of the corm and hence enter the air at all angles. The foliage is drooping, unlike any other kind, while the bulb is dissimilar to all others, being bright yellow, almost globular and scantily covered with a very thin papery husk. The flowers, though few, are very showy, deep crimson with an irregular band of white across the three lower segments. They are four and sometimes five inches across.

G. cruentus has one bad fault; it is a very late bloomer. This can be offset by early planting by those who can plant when they please.

G. psittacinus.—A peculiar and not very showy species. It has short, rigid foliage and flower-stalks about two feet high. The flowers are yellow, thickly dotted and lined mahogany red; throat yellow. The flowers are narrow and appear to only half open. Seedlings from this vary somewhat, though unmixed with any other kind. Among twenty raised from pure seed there are six which differ considerably from their parent, though plainly *G. psittacinus*, and nothing else. One or two of these are very handsome. This species and the next increase more rapidly, both by bulblets and by growth from the buds of the old corm, than any others I have seen; unhappily, they are the least desirable.

G. dracocephalus.—A very tall species (four and one-half or five feet), with a spike of narrow, inconspicuous flowers, green, spotted and grained with dull red. This, on my grounds, never has perfect anthers, and I have never been able to get a grain of pollen.

G. Saundersii.—This very beautiful species is offered for sale by nearly every dealer, and is, presumably, better known than most others. Its foliage is short and quite glaucous; the flower-stem not high and its flowers large and very showy, being scarlet mottled on the lower half with white; their form, also, is very elegant. Taken for all in all, this is one of the very best species.

The following being small in bulb and plant and flower, will give most satisfaction as pot plants. They should be grown in four or five inch pots in light, rich soil, and should, for the most part, be potted in late autumn.

G. tristis.—Like very many of the African species, this has narrow, almost rush-like foliage. I have been most pleased with this plant when I have potted the bulbs in autumn and kept them through the winter in the green-house, though like many, perhaps all, of the tender species, it may be successfully carried through out-of-doors if deeply planted in a dry soil and well covered with leaves. With me it blossoms in April, the flowers being four or five, comparatively large, of a light creamy tint, sprinkled with small dark spots, and strongly fragrant from dusk to dawn. How excellently adapted to insect fertilization! How plain that it is fecundated by some nocturnal moth allured by the large light flowers, whose powerful fragrance exists only during the hours of darkness! Unhappily for the theorists, who know so well why fragrance was given to flowers, however, *Gladiolus tristis* is perfectly self-fertilizing. It does not depend upon nocturnal or diurnal insects, but every blossom, even when protected from insect visits by gauze, will form a capsule of perfect seed. From such I have raised scores of seedlings. It is to me evident that perfume is not always (even if ever) provided to insure fertilization by means of insects.

G. recurvus, called also *G. ringens*, is best treated like *G. tristis*, as it is a weakly-growing kind. Its flowers, though few, are very pretty, being of a shade of lilac approaching blue, with a whitish throat.

G. gracilis.—A slender plant, with two or three lilac and black flowers. Though apparently hardier than many sorts, it is too delicate for the open ground.

G. cuspidatus.—Another rush-leaved kind, with flowers of a singular shape. Their segments are very long, narrow and twisted. Color, creamy white, blotched with purple and yellow.

G. villosus.—I received this three years ago and have been very unsuccessful with it, having seen, so far, but one flower. This was borne on a stalk ten inches high and was of a pinkish color. The entire plant is covered with short, fine hairs. Hence its name. This is not the *G. hirsutus* of Jacquin, but of Ker.

G. Milleri is a pretty species of small stature, with light yellow flowers.

G. alatus.—I have tried this species many times, but all in vain; it will not flower nor can I keep it. The bulb starts readily enough and so does the seed when obtainable. I have now over a hundred seedlings three years old and no larger than a grain of rice. If we may trust the published figures, this is one of the most beautiful species. Its colors are scarlet, yellow and orange.

G. sulphureus, considered by some to be a variety of *Babiana stricta*, is a small species, but robust enough to maintain itself in the open ground. Flowers few, yellow, but of a deeper shade than the name implies.

G. Watsonius.—This is called by Baker a species of *Homoglossum*, a genus not admitted by Bentham and Hooker. I have had it only during the present season. In April I received fifty bulbs of it from the Cape of Good Hope, some of which I found had started into growth. I potted them and they bloomed in June. The foliage is plaited in four strong

Fig. 57.—Deutzia parviflora.—See page 363.

folds. The flowers are of an intense vermilion color. A very desirable kind.

G. carneus.—At least four different plants have borne the name. I seem to have the one figured in Rédoute's "*Liliaceæ.*" It is pretty, though not showy. The ground color is pink with darker blotches on the lower segments. I have known this to endure a severe winter out-of-doors and blossom well the following June. I prefer to cultivate it in a pot.

I have many other species which I have not yet seen in flower, and of which I do not now wish to speak. At some future time I hope to describe them from my own knowledge.

Canton, Mass. *W. E. Endicott.*

The Vegetable Garden.

DURING the week of the Florists' Convention leading seedsmen of the city had special exhibitions of flowers, and some of them of vegetables as well, in their stores. In one of these the display of vegetables was excellent in itself, and, as everything was carefully and legibly named, the interest in, and usefulness of, the exhibit, was thereby much enhanced.

The mammoth Sugar Corn showed its superiority. It is a capital Corn, with large, well-filled ears and white fruit, but rather too big for table use. Most people prefer smaller Corn, like Squantum. Cucumbers showed nothing better than White Spine. Under the name of White German were exhibited large, white-skinned Cucumbers; but either for market or private use the green-skinned Cucumbers only can become popular. A large and beautiful specimen of the new Watermelon, "Green and Gold," cut open, was exhibited. The flesh is solid throughout, and of a butter-yellow color, and the rind quite thin. But no matter how delicious this Melon may be, the popular Watermelon must have red flesh and black seed. Kolb's Gem is such a Melon. It was exhibited, cut open, alongside of Green and Gold. The Hackensack was shown as the standard green-fleshed Muskmelon in the neighborhood of New York, and so it is. It is a large-fruited variety, rather coarse, but of good quality. The vines are vigorous growers, and bear a heavy crop of large, even-sized fruit, and it shows less tendency to premature decay than any other variety. Among salmon-fleshed varieties, Emerald Gem has no superior; indeed, it is as good in quality as the much-lauded European varieties grown in warm green-houses there, but which cannot be grown satisfactorily out-of-doors in this country. It is not a large Melon, but its flesh is exceptionally thick, sweet, buttery, and ripens up to the thin rind. Indeed, Emerald Gem as a red-fleshed, and Hackensack as a green-fleshed Melon, are our standard varieties around New York.

Among the many Tomatoes, Acme, Perfection and Trophy were as handsome as any. Mikado was the largest, perhaps, and a yellow-skinned form of it was also shown; but although yellow-skinned Tomatoes, such as Green Gage and Golden Queen, may have their special uses and friends, the popular Tomato must be red-skinned, and of round, even outline. An uncommonly large, reddish-fruited variety, named President Garfield, of very uneven form and many-ribbed, showed plainly what ought to be avoided among Tomatoes. The Dwarf Champion Tomato, sent out last year as a new variety, has round, even, fair-sized red fruit, and is really a desirable sort. It is of more compact growth than the other Tomatoes, and quite prolific, but it will not stand erect without supports any more than any other variety. Thirty-seven dishes of the Puritan Potato occupied one table, and represented the products of every section of the country—Maine, California, Texas, Georgia and other states. The Georgia tubers were the finest. This is a new Potato, raised by Mr. Coy from seed saved from Beauty of Hebron in 1882. The tubers are white-skinned and of the form of the well-known Snowflake. The Beauty of Hebron also originated with Mr. Coy. Ruby King was the largest Pepper, and no doubt will become the most popular variety. Celestial Pepper, a variety introduced from China three years ago, and first distributed this year, was also shown. The fruit is under medium size, green at first, changing to yellow tinged with purple, and ripens off scarlet. It is as pungent as most other Peppers. It is extremely prolific, and the fruit stands upright on the plants instead of nodding, as is the case with most large Peppers. It will hardly gain a foothold in our gardens except as an ornamental plant.

White Velvet was the conspicuous Okra. This is a new variety of dwarf habit, and with long, round, white pods. But, except in fixing the dwarfness of Okra, I question if we have lately made much progress in it. I sowed all the popular varieties May 24th last in rows alongside of each other. On July 25th we were picking from Dwarf Density, but not from any of the others. We did not begin picking from White Velvet till August.

A green plant of the new Dwarf Sieva Bean was shown full of seed-pods. In its line it is a decided acquisition. With it we can enjoy these delicious Beans without the bother of poles. The Dwarf Lima Bean was also exhibited full of green pods. A really dwarf Lima will be one of the most desirable vegetables ever introduced. We cannot reasonably expect to gather as heavy a crop of Limas from dwarf as from pole plants, nor that the dwarf plants would continue as long in bearing green Beans; but for many amateurs these dwarf Limas will be valuable, because they will do away with the annoyance of getting and keeping and setting up bean-poles.

Glen Cove, N. Y. *Wm. Falconer.*

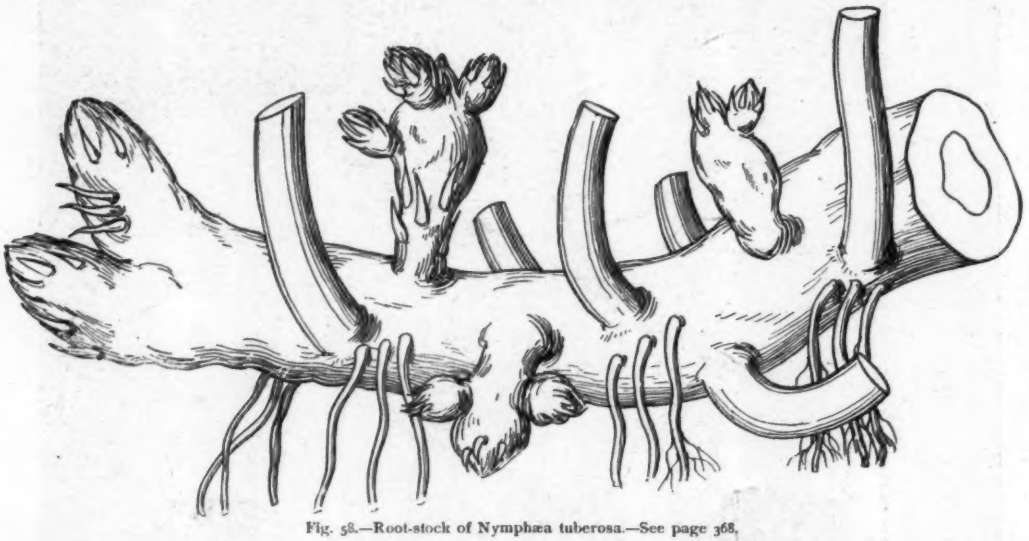

Fig. 58.—Root-stock of Nymphæa tuberosa.—See page 368.

Orchids.—*Phalænopsis Mariæ.*—This is a somewhat rare species, very strong in growth, producing a drooping, branched spike bearing a number of white flowers, barred and blotched with amethyst, the crimson lip being edged with white. Coming from Borneo, this plant requires abundance of heat and water, and should at no time be allowed to become dry. It seems to do far better with us in a tall cylinder than in a basket. The roots running to the bottom and forming quite a network, both inside and out, we use scarcely any potting material in the cylinders, but water overhead three to four times a day.

Lælia crispa.—Plants of this useful species are now in full beauty. Though an old and comparatively common Orchid, one seldom sees it in good condition. It is often too much coddled and grown too hot. All the best-grown and well-flowered specimens I have met with were grown under cool treatment, and some of the spikes have had ten or twelve flowers, and very large, while the usual number is but five or six. It is a beautiful Orchid, and did it but flower in midwinter would be highly prized by florists. The flowers are five to six inches across, pure white, and much curled or twisted. The lip is a rich crimson, edged with white, and beautifully crisp. It will grow well under the same treatment accorded to *L. anceps*, and, like it, prefers not to have its roots at all confined. The white variety of *Lælia elegans* may be had in flower nearly every month in the year—that is, if the plant be very

large, as the growths never appear all together. The individual spikes are very beautiful, and when cut, need only the addition of a few Ferns to make a handsome bouquet. This variety requires an intermediate temperature, abundance of air, and as much sunlight as can be given without burning the leaves.

tion to its great beauty it is interesting as being the first hybrid Cattleya artificially produced. Like all of this section of two-leaved Cattleyas, it is very difficult to keep in good condition for a long time, but it is now growing freely in the warmest end of the house. It should be kept somewhat cool and dry during the resting season.

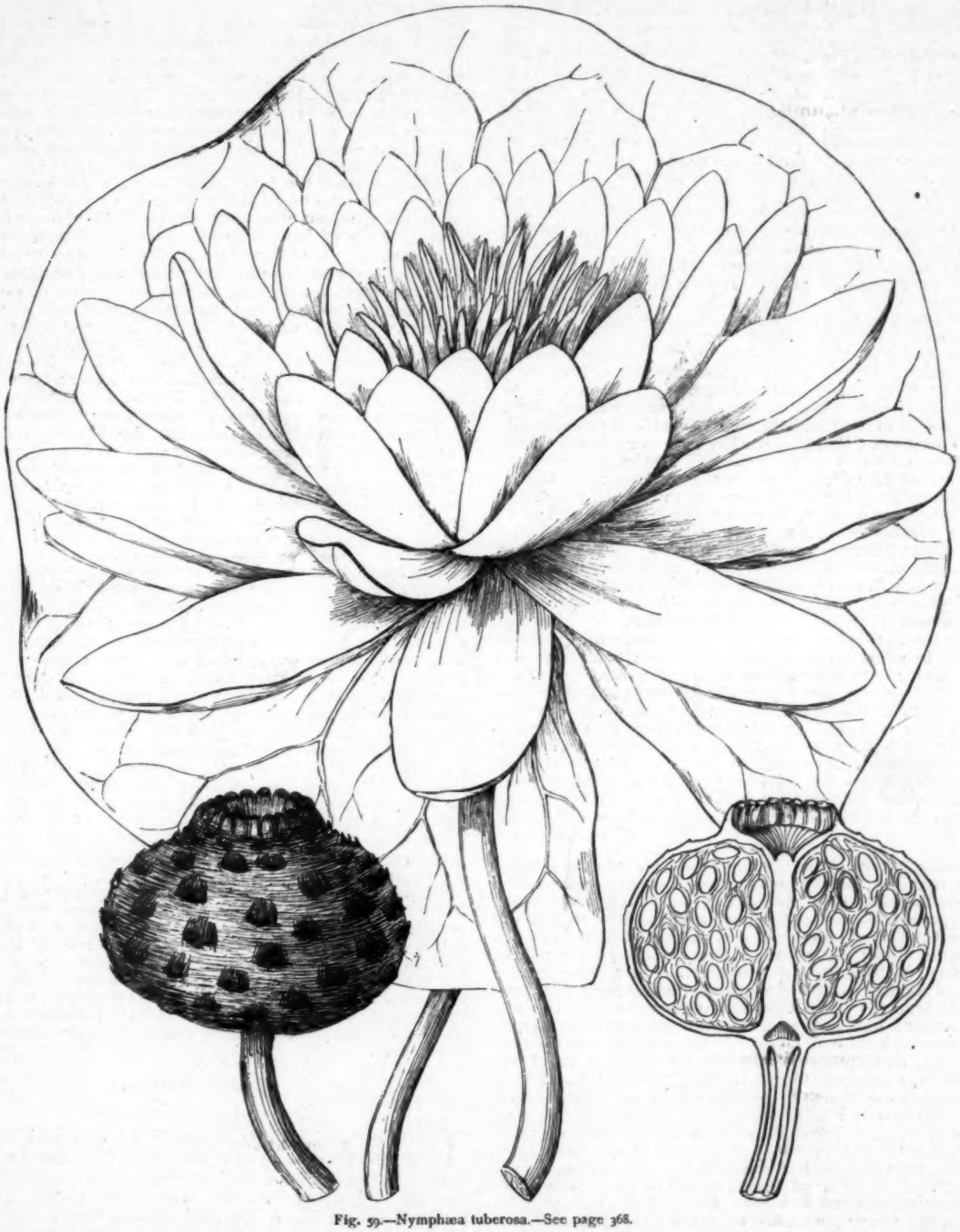

Fig. 59.—Nymphæa tuberosa.—See page 368.

Cattleya hybrida picta.—This is a very pretty hybrid between *C. guttata* and *C. intermedia*, in growth partaking of an intermediate character, while the flowers are more in the way of *C. guttata*, being of a pale olive green, beautifully speckled with purple, the petals being margined with pale rosy mauve. The front lobe of the lip is a deep purple, the lateral lobes and the column pure white. This is a very rare plant, if not the only specimen, while the typical hybrida is now lost. In addi-

Phalænopsis Esmeralda.—This is a small-flowered but very attractive Orchid, and very useful, because flowering at a season when every flower is appreciated. It produces racemes from one to two feet long, sometimes branched, bearing eighteen to twenty flowers of a beautiful amethyst color, lasting a long time in perfection. There are many varieties, the best being Regnieri, with larger and brighter-colored flowers. We have been most successful with these plants when grow-

ing them in a mixture of peat, loam and leaf-mould, with a little sphagnum moss, and potted in either pots or pans. They should have strong heat and abundance of water during growth, and should be kept very dry during the winter. They can be very easily propagated. The stem, which is made very quickly, may be cut into lengths of about an inch, potted into small pots, and put into a close frame. Every piece will break and make a nice plant in one season. *F. Goldring.*

Kenwood, N. Y.

Ranunculus.—Representatives of this genus are found in all temperate regions of the globe. The majority are natives of the northern hemisphere. *R. Lyalli* comes from New Zealand; *R. cortusæfolius* from the mountains of Teneriffe; *R. bulbosus*, *R. acris* and *R. aquatilis* are found in every temperate part of the globe, though probably, in many cases, naturalized. All enjoy a moist soil. General neatness of habit and the free production of blooms characterize all the species; and although the flowers, which are nearly always white or yellow in color, are often small, yet the neatness of their arrangement and symmetry of form always make them attractive. The majority are adapted for culture in the rock-garden.

The Persian and Turban forms of *R. Asiaticus* were once largely used for spring bedding. It used to be the pride of the old-time gardeners to "do them well." The art of doing them well now seems to be lost. It is a long time ago since I saw an unbroken, compact bed of them. Success is best attained by spring planting, especially in this country. As soon as the foliage begins to turn yellow they should be taken up and carefully matured in moderately moist sand. We must expect failure as long as we keep cutting them over as soon as past blooming, and otherwise disturbing them in order to plant Geraniums, Coleus and other summer bedding plants. It is further necessary to have the soil previously enriched—say, with a surface dressing of manure in the fall. Manure freshly put on in spring encourages the millepeds, which prey on bulbous plants when at rest, if left in the ground. It would be better if all bulbous plants were taken up after ripening.

A selection of the best kinds for the rock-garden include *R. acris, fl. pl.*, otherwise known as *R. speciosus, pl.*, a good double yellow; *R. amplexicaulis*, with large, pure white flowers and glaucous foliage; *R. anemonoides*, of dwarf habit, flowers white, pink-tinted, almost stemless, with elegant, glaucous, much-divided foliage. *R. Ficaria* is the common Pilewort. In some parts of England it is a common weed, growing under trees where grass refuses to grow. Under cultivation it is quite a pretty plant, its flowers coming double. *R. fumariæfolius* has elegant Fern-like foliage, and small, double yellow flowers. *R. spicatus* is a very rare tuberous-rooted species from northern Africa, adapted only for culture in the green-house. If only for its being a distinct and peculiar Buttercup, it is worth growing; but it has handsome palmate foliage, and large yellow flowers, appearing and flowering only in the fall and winter, and dying down towards spring. *T. D. Hatfield.*

Roses.—Pot-grown Hybrid Perpetuals for early forcing should now be ripening their growth, as only solid, well-ripened wood may be depended on for this purpose. And in this ripening process some care is necessary, as they should not be allowed to become so dry that the wood shrivels, as such a condition works injury rather than benefit to the plants, and usually results in a weak growth and few flowers when forced. Hybrids grown in the open ground during the summer, and lifted in preparation for winter forcing, are frequently better if held back so as to come in as a second crop; the pot-grown plants being used for the first, as the roots of the latter are likely to be in a better condition to stand the extra exertion of early forcing. If regular Hybrid houses are used, in which the Roses are planted out in solid beds or on benches, the growth will be more readily matured by stripping off the sashes during the summer months and leaving them off until cold weather, provided the season is not too damp, as in the latter case the shoots remain too soft and sappy for early work. And in the planting of such houses it is well to group the varieties used, so that the earliest sorts may be planted in one house, or section of a house, and those more obstinate in regard to forcing may be placed by themselves in another section, to be used for a later crop, thereby insuring a succession of bloom. For instance, such Roses as Anna de Diesbach, Magna Charta and possibly Mrs. John Laing may be used for early flowers, to be followed by Paul Neyron, Baroness Rothschild, Mabel Morrison, Captain Christy and Alfred de Rougemont, and a number of others equally good for this purpose, if it is thought desirable to use a more extended list. One variety in particular, the ever-popular General Jacqueminot, should certainly be added to either or both catalogues, for, when properly managed, this old favorite may be flowered as early as any of its class *"W."*

Philadelphia, Pa.

Quinces on Apple Stocks.—A correspondent wishes to know whether he can grow Quinces on Apple stocks by the root-grafting process, and whether the quality of the fruit would probably be affected?

Yes, he can grow the Quince in this way. The so-called Meech Quince has been propagated by tens of thousands in this way. Whatever effect this mingling of blood might exert upon stock or graft can hardly be known, but the effect on the fruit would probably be slight. The Quince is generally and readily grown from cuttings in moist soils. Its tendency is to make a mass of fine fibrous roots. The Apple makes no such mass, and if its roots were the sole dependence of graft and stock the growth would probably be affected. But as both stock and graft are planted below the surface of the ground, the Quince would eventually root, the Apple stock acting as a support or starter till the Quince roots were produced. This is the result in the case of Dwarf Pears on Quince stock. When the Pear stocks root above the Quince, the trees become standard Pear trees, and the Quince stock finally dies or becomes so enfeebled as to be of no further use, because, perhaps, their natural rooting place is near the surface. Whether this would be the final result of the Apple and Quince union I do not know, and I hardly think the practice has been tried long enough to determine. My experience with Pears on Apple stocks is that they make a feeble growth for a few years, and finally die. The incompatibility is fatal.

Time and experience with the uncongenial affinities of Pear and Apple has tended to materially modify the Dwarf Pear craze, so popular twenty-five years ago, so that its most zealous advocates are seldom heard from now, and some have so far revised their opinions as to declare they would not plant them as a gift. In conclusion, I think it safe to say that the practice of root-grafting the Quince on Apple is only admissible is case of rare or scarce varieties. *E. W.*

The Peach Yellows.—A case is cited in *Orchard and Garden* where a Peach tree standing in rich ground showed this spring every symptom of the yellows. Early in July a quart of muriate of potash was forked into the soil about it with magical effect. New and healthy foliage began to appear, and within a fortnight after the application the tree appeared in good health. This corroborates the experience of many peach-growers in New Jersey, who have found potash, as recommended by Dr. Goessmann, a sovereign remedy for many trees apparently afflicted with the yellows. Indeed, so often has this cure been repeated, that many peach-growers in that state do not believe that there is any such disease. The only disease they fear is starvation. On the other hand, peach-growers in Michigan are thoroughly convinced that such a disease exists, and that it is incurable. Indeed, laws have been enacted to enforce the destruction of affected trees, and thus prevent the spread of what is considered a most dangerous contagion.

Perhaps, under the circumstances, it would be well to refrain from enforcing the law to exterminate diseased trees until the potash cure had been tried. Admitting the existence of a genuine disease, it is not impossible that a lack of some constituent in the soil may enfeeble Peach trees, and give them the same appearance as that of trees affected by the disease. If an application of kainit or other form of potash will save the trees and renew their vigor when in this condition, it would be well to try the potash remedy before the more heroic one is resorted to. *S.*

Plant Notes.

Nymphæa tuberosa.

THE figure of this handsome Water Lily which appears in the present issue is the first which has been published, unless the doubtful *N. reniformis* of De Candolle, figured by Delessert in his "*Icones Selectæ*" (ii, 3, *t.* 5), is really the same plant. *N. tuberosa* was first made known by Paine in his "Catalogue of the Plants of Oneida County, New York," published in 1865. It may be distinguished from the common species of eastern North America (*N. odorata*), with which, doubtlessly, it is often confounded, by the thicker root-stock (see Fig. 58), bearing spontaneously-detaching and often compound tubers, by the much larger and more prominently veined leaves, green on both faces, and which, when fully grown, are

often raised above the surface of the water on the stout petioles; and by the much larger flowers, four to ten inches in diameter when expanded, the petals proportionally broader and blunter than in *N. odorata*. The flowers are scentless, or almost so. The fruit is depressed-globular, with few globular-ovoid seeds, barely enclosed in the aril at maturity.

N. tuberosa is the common Water Lily of Lake Champlain and of the waters which flow into it. It has recently been detected in a very depauperate form near Trenton, New Jersey, by Dr. Abbott, and it occurs at Meadville, in Pennsylvania. These are the only places were it has been noticed near the Atlantic sea-board, but it is said to be common from western New York, west and south, but its distribution is not yet at all well known. It is one of the most beautiful of all the Nymphæas, and by far the most beautiful of those which can be grown in the Northern States without artificial heat, equalling *N. odorata* in the delicacy of its petals, although the flowers lack the delicious fragrance of that species.

N. tuberosa is easily cultivated; indeed, when once established, it increases so rapidly by means of the detaching tubers and by seed, that it is sometimes difficult to keep it within reasonable bounds.

The flowers (on cultivated plants) open about eight o'clock in the morning, and close in pleasant weather between two and three o'clock in the afternoon. They open twice or sometimes three times if the weather is overcast. *C. S. S.*

The Forest.

Forestry in California.—I.

THE first business thought of a practical person in looking at a forest is, What are its products worth—that is, what can be made out of it? For the products of the forest enter into the life of every one. The varnish of the artist, the rubber, the gums, the resins of commerce, the barks of the tanner, the corks of the vintner, the handles of our tools, hoes, plows, etc., our dye-stuffs, our wagons, the ties and cars of our railroads, fences and telegraph-poles, furniture, wharves, boats, ships, and in America, even the houses we live in, are largely the product of the forest. Few people appreciate what the annual drain on our forests is; even such small things as matches consume great amounts of lumber every year; charcoal and fuel are a great drain on our forests; even coal is but a fossilized form of wood. Nuts, fruits and medicines, such as cocaine, quinine, etc., cannot be overlooked. When we thus consider the products of the forest, it will not be a surprise to learn that these were estimated in the United States for the year 1880 at $800,000,000. The last government statistics at my command show some of our principal crops to have been:

Wheat,	$474,291,850
Cotton,	280,266,242
Gold and Silver,	74,400,000
Coal,	94,500,000
Iron Ore,	20,470,000

It will thus be seen that the economic value of our forest products is nearly double that of wheat, more than ten times that of gold and silver, and forty times that of iron ore. The census, the agricultural reports, the recorded observations of intelligent men, as well as the individual experience of every one who has by travel become acquainted with the country, show that the consumption and destruction of our forests now so far outruns their reproductive capacity, that at the present rate in a few years we shall have no forests at all, and their vast crop, valued at $800,000,000 a year, must disappear from our census books. We are eating into our capital and providing for no renewal of it. It is not alone the good lumber and firewood taken that we must calculate on, but the waste that accompanies it, and the destruction annually caused by fire. These the best authorities state to be even greater than the drains of commerce.

Forest fires destroy every year millions of this, the people's property, and blacken and mar the landscape. Besides, the lumbermen, in the prosecution of their business, waste fully as much timber as they use. In my visits to Mendocino County, and other centres of lumbering activity in this state, I have seen left to rot or burn large portions of the trees felled, and again and again I have seen magnificent trees felled and left untouched because they did not fall right, or for some other trifling reason. In this way much lumber is wasted and firewood enough is annually destroyed to supply the whole of California for years.

Besides the waste, this *débris* in the oft-recurring fires makes an intense flame and heat, endangering all neighboring forests and destroying, often entirely, and always much of the woods they traverse; and also the humus in and above the earth. It may be well to say just here to those having lands to clear that it has now been demonstrated thoroughly that burning over land destroys the best part of the soil, and thus permanently injures its producing capacity. The hotter the fire, the deeper it destroys the soil. Experiments in Canada show that a hundred years of repose and forest action will often not re-establish the strength and fertility of the soil passed over by hot fires.

Besides the regular lumbermen, who operate on a large scale, there are numbers of individuals engaged in making shakes, etc., who use only selected trees, chiefly the Sugar Pine, which in this state reaches a great size, is very valuable, but does not readily reproduce itself. To be used advantageously for this purpose, these trees must be in certain conditions, which can only be told after they are felled. Thus thousands of trees, and of the very best, are annually felled and found unsuitable, and left to rot. At the best these men only use about twenty feet of the magnificent trees they cut, the rest being waste. The Sugar Pine is fast disappearing. The tan-bark men also destroy great numbers of trees, taking only the bark. I have seen in this state, in one place, woodmen destroying trees, cutting off only the branches for firewood, and leaving the trunk and bark unused. In other places the lumbermen leave the branches and firewood, and taking only the trunks; again, tan-bark men leave the entire trees, using only the bark. It may not be a crime to allow such unnecessary waste, but it is unmitigated folly to be thus throwing right and left a property that brings us in $800,000,000 a year.

The forests are also much injured by sheep and goats that are driven into them for a few weeks' pasturage; these destroy the young trees and pack the ground so that it cannot so well receive and hold moisture. Besides this, the shepherds often deliberately set fires to open the country, or, as they say, to improve the pasture, thus destroying, in one season, more lumber, fire-wood, etc., than the value of all the sheep and goats and their products that have or ever will visit the scant mountain pastures.

Every considerable government of Europe now has its forestry department. Every one of them gives a net revenue. The system pursued is nearly the same in all. By it the forests are preserved and increased in area; at the same time the maximum of fire-wood and lumber consistent with this preservation is taken out; no waste is allowed.

The revenues from these departments show that a large, properly managed forest is a source of income. Saxony has a net annual income of $3.25 from each acre in her total forest area. Alsace-Lorraine about the same. British India, although a new convert and under heavy expenses, had, according to the last returns in my hands, a net income from her forest lands of over one million dollars.

All the European governments, save England, which is exceptionally situated, have forest departments served by men instructed in forest schools, some of which are celebrated, such as those at Hanover, Aschaffenberg, Minden and Nancy, each department giving more or less net revenue. In Austria, Italy and France considerable works in forest planting, from which little or no direct revenue can be expected, are being done.

Such desolate places as the Karst, in Austria, and the Landes, in France, are thus being reclaimed. Trees are also being extensively planted on the water-sheds of rivers and torrents; in the first case the object is to re-establish regularity of flow in the streams, and in the second by preventing the rapid delivery of heavy rains from bare surfaces, to reduce and eventually end the destructive action of rivers which are either beds of bowlders or glittering wastes of sand, or rushing torrents of turbulent water, charged with mountain *débris* and carrying destruction in their course to the valley lands. These works of the foresters are productive to the nation, but show no revenue to their department, a fact that must be taken into consideration in the economic management of forests. But some of these works have become remunerative. The Pine plantations on the south-west coast of France, about Arcachon, to reclaim the desolate Landes, are of these. In that section the sand dunes of the coast were rapidly advancing on the interior in hills over 200 feet high; fields, houses,

villages and even church steeples were entirely buried out of sight. Major F. Bailey, R.E., in a recent trip to the Landes, speaks of his guide tying his horse to the projecting point of one of these covered church steeples.

The planting of these forests near the coast, together with the preliminary work necessary to establish their growth and stop the rolling sands, cost the French government about $40 per acre. Tracts in these forests are now rented for five years, with the privilege of cutting selected trees and tapping others for resin, at a price equaling about $70 per acre. It will thus be seen that under even adverse circumstances a scientific forest management, designed for protection to a country rather than for direct profit, may be made remunerative.

Correspondence.

To the Editor of Garden and Forest:

Sir.—The article, with illustration, in Garden and Forest, July 11th, assumes, not without reason, that *Rosa lævigata* is a foreign species, introduced and naturalized through a large part of the South Atlantic and Gulf States. Nevertheless, it seems to me that, in the absence of positive proof of its introduction, it is still a question whether Michaux was not correct in considering it a native. The plant was known as the Cherokee Rose at least a century ago, and this fact seems to indicate that it found its way into the white settlements nearer the coast from the Cherokee country in upper Georgia and the Carolinas. More than fifty years it was known in cultivation at Salem, North Carolina, and vicinity, where the evergreen foliage sometimes suffered from the severity of the winters. The tradition there was that it had been introduced from the "Cherokee Country," having been brought by Moravian missionaries of Salem, whose stations were in the region which has since become famous through the battles fought in the late war—Mission Ridge, Lookout Mountain, etc.

Elliott, in his "Botany of South Carolina and Georgia," published in 1821, speaks of it (as stated in the article referred to) as having been cultivated in the gardens of Georgia for upwards of forty years, therefore as early as in the years of the Revolutionary War. If introduced from abroad, it must have been when the settlements of Georgia had scarcely reached the upper country—Savannah having been founded in 1733—and it is difficult to conceive that it should have been designated from the first as the *Cherokee* Rose if it reached the country through the lower settlements, and that it should have become so common and well-established about one hundred years ago that the careful and experienced observer, Michaux, "mistook it for a native plant." Was he not right?

On referring to Grisebach's "Flora of the British West Indian Islands," I find *Rosa lævigata* given (on the authority of an old friend of mine) as "naturalized in Jamaica," and he adds, "introduced from China and Japan." The question arises, Was it not rather introduced in Colonial times from Charleston or Savannah, when intercourse and trade were frequent? Although the plant flourishes luxuriantly in the mountain regions, it exhibits unmistakable evidences of its introduction from abroad. More than fifty years ago it could be met with near houses, and usually covering stone-walls. It was not regarded as a rare plant or of recent introduction, the persons inquired of usually being ignorant of the way it got there. In the year 1848, passing a deserted coffee-plantation in the interior of the island, among the mountains, I came upon what had evidently at one time been a hedge of Cherokee Rose. The plants had spread and flourished until they covered a space twenty feet broad, and formed a mass higher than a man's head on horseback, probably outdoing those in the illustration by Dr. Lanborn. The shining foliage and the hundreds of pure white Roses formed a beautiful sight—all the more striking and surprising because (with the exception of *Rubus Jamaicensis*) it was the only representative of the order Rosaceæ I had met with in a flourishing and apparently naturalized condition. Trees that had grown up spontaneously, and the deserted and decayed buildings, indicated that cultivation had been abandoned for many years—probably not less than twenty—but there was the long, straight line, indicating unmistakably the original hedge. And it was this hedge idea (the use to which the species is generally put in the Southern States) which seemed to me, at the time, a reason for thinking that the plant had been introduced direct from our own country, and not from England, whence it must have come, if not from the United States.

If, in the island of Jamaica, under the most favorable conditions, and after many years, it is unmistakably evident that the plant was introduced, is it likely that in Georgia, where the plant, if introduced, could not possibly have been an inhabitant longer than I found it in Jamaica, it should have outgrown the evidences of its introduction so as to deceive Michaux into regarding it as a native?

Among flowering plants, as you know, there are instances of geographical distribution quite as remarkable. Looking at Grisebach's work the other day, I observed, among the Orchideæ, *Phajus grandifolius*, unmistakably a native of the mountainous parts of Jamaica, also "a native of tropical Asia to Hongkong." And taking up Gray's Manual, to determine, for a young friend, the perennial herb *Phryma leptostachya*, common in our woods, we found the remark: "Also in the Himalayan Mountains."

On the whole, therefore, is it not still to be proved that *Rosa lævigata* is not a native of the south-eastern United States, as well as of the region corresponding in climate in eastern Asia?

Hope, Indiana. *F. R. Holland.*

[Botanists have long held the opinion that the Cherokee Rose is not an American plant. Although thoroughly naturalized in some parts of the Southern States, it is not found remote from actual or ancient settlements, and the fact that it does not occur at all in the upper country, once the home of the Cherokee Nation, must dispel the belief that these Indians introduced it to the coast settlements. The fact that it has not become as firmly established in Jamaica as in the Southern States would be accounted for by the difference in the climate of these two regions, that of Jamaica even at high elevations above the sea being too hot for a Chinese plant. Is it not possible that a ship trading from China to Charleston, or some other American port, may have brought this Rose direct to this country, and that it may then have been taken to Jamaica from this country? Or it may have been introduced first into Jamaica and then brought to this country. *Rosa lævigata* seems to have been cultivated in England, however, as early as 1759.—El.]

Recent Publications.

Flora of the Hawaiian Islands: A description of their Phanerogams and Vascular Cryptogams, by Wm. Hillebrand, M.D. New York: B. Westermann & Co.—This is a description in English of the plants of the Sandwich Islands, written by a German physician who resided on the islands during a period of twenty years, which were principally devoted to a critical study of their flora, although, having mastered the language, he practiced medicine in Honolulu with great success, holding besides several important offices under the Crown. The Hawaiian Islands are more remote from any continent than any group of similar extent; the character of their flora, therefore, and its relationship with other insular and with continental floras, are matters of extreme interest. As might be expected, the flora of these islands, in which "a single day's march will carry the traveler from the tropical heat of the coast to the region of perpetual snow," or where, by crossing an island, one may go from a climate with a rainfall of 180 inches to one of 30 inches, is rich in genera; and from their isolation especially rich in endemic species. Dr. Hillebrand describes 844 species of flowering plants, distributed in 335 genera, and 155 vascular cryptogams in 30 genera, making 999 species in 365 genera. Not less than 115 species, weeds in cultivation, escapes from gardens and accidental arrivals on the shores of the islands, have become fully established since these islands were discovered, and 24 species are supposed to have been introduced prior to the coming of Europeans. Eight hundred and sixty species, therefore, divided among 265 genera, or 3.25 species to one genus, are indigenous to the islands. Of these 860 species not less than 653 or 75.93 per cent. are endemic, 250 of these species belonging to 40 endemic genera. In the Hawaiian Flora are forms whose relationship can be traced to the plants of the South American continent, to those of Mexico and Australia, and to Polynesia. The shrubby *Lobeliaceæ*, of which there are four or five endemic genera, with fifty species, some of which are trees of considerable size, forming perhaps the most interesting and remarkable group of plants in this flora, have their nearest relatives in the South American Andes. The Australian flora is represented by Acacias and Metrosideros, the former quite Australian in their peculiar structure; while *Cytandra*, a Polynesian type, is represented on these islands by thirty endemic species. The most generally

distributed and the most valuable timber trees of the islands, although now fast disappearing of merchantable size, are *Metrosideros polymorpha* and *Acacia Koa*. The former, which is the most generally prevailing tree on the islands, between 1,500 and 6,000 feet elevation, produces a very hard wood, highly esteemed for fuel, and sometimes used in building. The Acacia, Dr. Hillebrand considers the most valuable tree on the islands. The wood makes excellent fuel, and is much used for building and for cabinet work, for which its beautiful grain well adapts it. It was from the trunks of this tree that the natives cut their great war-canoes. *Coniferæ* have no representative in this flora, a fact much less remarkable than that, besides the Cocoanut, there is but one genus of Palms (*Pritchardia*, a Polynesian genus of three species) with two species. Some interesting plants in the Hawaiian flora are a Dock (*Rumex gigantea*), with a woody base, which grows up among the trees of the forest to a height of forty feet; a Geranium, with a stout trunk, twelve feet high, and the shrubby or arborescent members of the Lobelia family, with fragrant flowers. Dr. Hillebrand, who left the islands as early as 1871, did not, unfortunately, live to see his book passed through the press, and his notes upon the distribution of species and the various aspects of the vegetation of this group of islands are left in a fragmentary and unfinished condition; and it is to his son, Dr. W. F. Hillebrand, of the Smithsonian Institute, that the last cares of publication have descended.

The "Outlines of Botany," written by Mr. Bentham, to precede the British and Colonial Floras, prepared in the herbarium of the Royal Gardens at Kew, is joined to the present work.

Periodical Literature.

Chambers' Journal for July contains an interesting article on "The Kola Nut," which is an abstract of an address delivered before the Fiji Agricultural Association, combined with extracts from Mr. T. Christy's book on "New Commercial Plants and Drugs." The tree which bears this nut is the *Sterculia acuminata*, a native of the west coast of Africa, between Sierra Leone and the Congo, and cultivated in the East and West Indies. It begins to bear in the fourth or fifth year after planting, but does not produce a full crop until it is ten years old, when its yield averages 120 pounds of seed. Two collections of seed are annually made, one in the autumn and one in the spring months. "When the fruit is ripe it takes a brownish-yellow color, and in this condition dehiscence of the capsule commences along the ventral suture, exposing red and white seeds in the same shell. . . . . As many as five ripe carpels may result from a single flower and these may each contain from five to fifteen seeds; but in some cases carpels are found containing only a single seed. The seeds removed from their envelope weigh . . . . from five to twenty-five or twenty-eight grammes. The epidermis is the principal site of the coloring matter, and beneath it is a tissue consisting of a mass of cells gorged with large starch granules, comparable to potato starch. It is in these cells that the alkaloids, caffeine and theobromine, are found in the free state."

In preparing the seeds for transportation, they are removed from their husks, freed of their skins, carefully picked over, and packed in large bark baskets lined and covered with leaves of Bol (*Sterculia heterophylla*). If these leaves are constantly kept moist and the seeds are picked over and repacked about once a month, they may be kept in good condition for long periods, and are, in fact, thus transported from near Gambia and Goree to the Soudan or Timbuctoo, and thence to Tripoli or Morocco.

The value of the Kola nut is great, both as an article of food and as a medicine. It contains five times as much caffeine as tea and more even than coffee, and is a remedy for nervous complaints, heart troubles and digestive derangements. Prepared as chocolate, with sugar and vanilla, it is ten times more nutritious than cocoa, and the use now made of it in English hospitals confirms the verdict of the natives of west Africa, who are accustomed to depend largely upon it for subsistence in long caravan journeys. In the interior of the country it is so highly prized, that a dry powder formed from it is purchased by an equal weight of gold dust. Its uses here are not simply dietary, but, so to say, social. An interchange of white Kola nuts between rival chieftains means peace; of red ones, a challenge. Proposals of marriage are made with white Kola nuts, are accepted in the same manner, and refused with red ones. Oaths are administered by a person stretching out his hand over Kola nuts while he swears, and eating them immediately afterwards.

The Kola tree grows in low, damp or even marshy ground, and will flourish from the sea level up to an elevation of a thousand feet. Its cultivation is strongly recommended by Mr. Christy, as it is more easily raised than the Cocoa plant, and as the superior nutritive qualities of its fruit become better known, the demand for it rapidly increases.

Naudin, in the *Manuel de l'Acclimateur*, speaking of the properties of the Kola, calls attention to the fact that it is often confounded with a false Kola called *Kola mâle*, or "Bitter Kola," which is produced by a shrub of the *Guttiferæ* (*Garcinea Kola*), which grows in the same regions. The mistake is often made by the natives, although the properties of the two nuts are quite different.

Recent Plant Portraits.

BEGONIA GERANIOIDES, *Bulletino de la R. Società Toscana di Orticultura*, July; a white flowered South African species, of botanical rather than of horticultural interest.

SPATHOGLOTTIS AUREA, *Gardeners' Chronicle*, July 28th; from the plant which, under the name of *Spathoglottis Kimballiana*, recently received a certificate from the Royal Horticultural Society of London. "The cultural treatment it requires is much the same as that afforded to the genus Bletia, the material used in potting being turfy, yellow loam, peat and sphagnum moss, with a little silver sand added—the Spathoglottis being terrestrial plants. *Spathoglottis aurea* was first sold at Stevens' rooms by its importers, F. Sander & Co., in September, 1886, with a glowing, but it must be observed, an accurate description. It forms an admirable companion to the beautiful *Spathoglottis angustorum*, which is the same in general appearance, but white and rose, and the rather smaller bright Rose, *S. plicatum*."

CLEMATIS COCCINEA, *Revue Horticole*, August 1st; an admirable figure of this now well known Texas species.

Botanical Magazine, May, TREVESIA PALMATA, 7008; "one of the most conspicuous features of the tropical jungles of the Central and Eastern Himalaya, Assam, and the hot, humid regions of the Khasia Mountains and Chittagong, where its slender stem, crowned with terminal whorls of spreading, broad, fan-shaped, long-petioled leaves, rising above the herbaceous forest undergrowth, at once attracts attention." The greenish white flowers, in long peduncled panicles, are not showy, and emit a heavy, disagreeable odor.

ECHINOCACTUS HASELBERGII, *t.* 7009; a dwarf species of unknown origin, three inches in diameter, covered with slender spines, and producing small orange-red flowers.

SARCOCHILUS HARTMANNI, *t.* 7010; a delicate Orchid from the mountain forests of Queensland, with white flowers three-quarters of an inch in diameter, the sub-similar sepals and petals handsomely blotched with red near their base.

ARISTOLOCHIA WESTLANDI, *t.* 7011; a large-flowered species, native of southern China.

NARCISSUS PSEUDO-NARCISSUS, var. JOHNSTONI, t. 7012; a native of the neighborhood of Oporto.

HEUCHERA SANGUINEA, *Gardeners' Chronicle*, August 4th.

STYRAX OBASSIA, *Gardeners' Chronicle*, August 4th; a well known and hardy Japanese species, and, so far as the foliage is concerned, the hardiest of the genus.

NEPHRODIUM TUERCKHEIMII, *Botanical Gazette*, *t.* 11, July, 1888; a native of Guatemala.

CYRTOPODIUM SAINTLEGERIANUM, *Gardeners' Chronicle*, August 18th; "this may be regarded as the showiest form of the variable *C. punctatum*, from which it does not seem to differ in botanical features; it is, however, far handsomer than the general run of the species, and the bracts, which are highly developed, are barred and blotched with chestnut-red of the same bright hue as that seen on the yellow flower-segments."

STUARTIA PSEUDO-CAMELLIA, *Gardeners' Chronicle*, August 18th.

PROLIFEROUS STRAWBERRY, with flowers produced from the side, *Gardeners' Chronicle*, August 18th; an interesting figure as illustrating the true character of the strawberry, which is not a berry, as is popularly supposed, and not even a fruit, but the swollen and enlarged end of the flower stalk, the true fruit of the strawberry being the small dry stones, improperly called seeds. That the strawberry is really an enlarged stem the buds developed from the side of the specimen figured very clearly show. One of these is so perfectly organized that it has leaves, the commencement of a runner and a perfectly developed terminal flower.

SALIX PHYLICOIDES, *Botanical Gazette*, July, 1888; an Alaskan and East Siberian species of Willow.

Notes.

Apples are now being shipped from California to Australia.

The Japanese Stuartia, which is just now attracting attention in England, was exhibited in this city by Mr. Samuel B. Parsons as long ago as 1877. It was introduced into this country some time before by Mr. Thomas Hogg, to whom we are indebted for so many Japanese plants.

At the great exhibition of the Peninsula Horticultural Society at Wilmington, several fruit-growers made most attractive displays of the fruits of the entire season, the earlier ones being preserved by cold storage. Of Peaches, for example, the whole list was represented, from Amsden's June down to the very latest. The specimens were large and finely colored.

Mr. Thomas H. Douglas, Head Forester of the California State Forestry Commission, writes that *Catalapa speciosa* is very promising as a timber tree in San Diego County. The trees do well on sandy hills without irrigation, outgrowing even the Eucalyptus on such soil. *Catalpa bignonioides* is distinctly inferior wherever compared with *C. speciosa* in Southern California.

About two thousand acres of land are now devoted to Strawberry culture in the neighborhood of Centralia, Illinois, and from this point as many as 190 car-loads, or 2,097,600 quarts of berries have been shipped in a season of twenty days. The largest Strawberry field contains thirty acres, but the smaller ones pay better in proportion, and nearly every back yard in Centralia brings in pocket money.

Mr. Wm. Goldring, our London correspondent, has lately been commissioned by the Gaikwar of Baroda, one of the native princes of India, to design and carry out some important landscape works, consisting of gardens and pleasure grounds around his palaces and some public parks and gardens in other parts of his dominions. Mr. Goldring will spend the winter months for the next three years in India, and, in the course of his studies, will visit many of the notable gardens of that county. Descriptions of these gardens, together with notes on Indian horticulture and forestry, will be prepared by Mr. Goldring from time to time for Garden and Forest.

There now seems to be little question that an efficacious remedy for the Black Rot of Grapes has been found in certain preparations of copper sulphate. The experiments carried on under the direction of Professor F. Lamson Scribner, for the Department of Agriculture, have been characterized by great care and thoroughness, and if the results hoped for are realized, they will prove of incalculable value to all Grape-growers where the Black Rot and Mildew have been destructive. If this treatment will enable us to grow the varieties of *Vitis vinifera*, which has been impossible heretofore on account of these diseases, Professor Scribner's work will have a still greater practical importance.

Two years ago Mr. Carman, of the *Rural New Yorker*, succeeded in fertilizing the pistils of the Raspberry with pollen from the Blackberry, and planted the seeds which resulted from this union. Of the eighteen hybrids secured, three have fruited this year. One of them is a vigorous plant with large leaves, nearly thornless canes, and, to all appearance, a Raspberry with yellow fruit of medium size and of the quality of the Caroline. The second bears a red berry resembling the Hansell in size, color and quality. The third plant resembles a Blackberry, with flowers like those of a Raspberry, and bearing jet black berries with a Raspberry flavor. All the plants bear some imperfect berries, and, judging from their behavior this year, do not promise to be of much economical value.

The meeting of the Brooklyn Park Commissioners last week was invested with a peculiar interest from the fact that the advisability of engaging Messrs. Olmsted & Vaux as Landscape Architects Advisory came up for discussion. A letter from these gentlemen was read stating the conditions under which they are prepared to give their services to the Board in that capacity. It was urged by those who favored the measure that inasmuch as Messrs. Olmsted & Vaux were the original designers of Prospect Park, it was fitting that when $200,000 are to be expended for its permanent improvement, these artists should be consulted as to the development of the plan. Dr. Storrs expressed the views of the Commissioners who appreciate the value of special training when he said that they clearly needed the counsel and advice of men who have given their lives to the study of this kind of work. The matter was laid over until a future meeting, when a definite form of contract will be presented for acceptance. Some difference of opinion was manifested, and the final decision of the Board will be awaited with interest.

The current number of the *Art Review* contains an article by Mr. George Forbes, called "The Picturesque Adirondacks," which is well adapted to convince readers who have never visited this region of its great value to the people as a sanitarium in the widest sense of the word—as a place of recuperation and refreshment for body, mind and soul. As his title indicates, Mr. Forbes's aim is to disclose the beauty of the Adirondack country rather than its economic value. It is not his purpose, he explains, to inquire into the matter of its "prodigious importance as the ultimate source and reservoir of the water-supply of the State, and into the corollary question of its Forestry-laws." Yet he cannot refrain from asking whether, even if "its æsthetic charms" were alone in question, they do not "demand a legislative enactment that shall make the entire section a State Park, as free to the people of this and other States as are the Niagara Falls Reservation and the Yellowstone National Park?"

The *Weekly Press* (Philadelphia) has been collecting through its correspondents some interesting data as to big trees in various parts of the country, and measurements of remarkable trees in fourteen states are published in the number for August 22d. Among these are a Live Oak in Marion County, Florida, with a trunk circumference of thirty-one feet, and a spread of branches of nearly 139 feet; a Sugar Maple in Bradford County, Pennsylvania, with a girth of sixteen feet, and branches spreading eighty-three feet; an Elm in Shinnston, West Virginia, with a girth of twenty-seven feet three inches, a spread of branches of 123 feet, and a total height of 110 feet; a Chestnut in Lancaster County, Pennsylvania, with a circumference of twenty-five feet three inches, and branches spreading eighty-eight feet; a sycamore in Wabash County, Illinois, with a girth of twenty-eight feet, and a Sassafras at Johnsville, Pennsylvania, with a circumference of thirteen feet six inches three feet from the ground, a spread of branches of thirty-five feet, and a total height of forty-six feet.

At the Sixtieth Annual Exhibition of the Massachusetts Horticultural Society last week the display of out-door flowers was not so large as usual, owing to the protracted rains, but the quality of those shown was of the best, and the arrangement of the cut flowers and green-house plants was better than usual. Fruits were exhibited in great profusion, although Apples and Pears were not so abundant as in former years. They were exceptionally free, however, from fungus and blight. Vegetables were shown in great abundance and variety and not a single poor specimen was seen, and the fifty dishes of perfect Tomatoes placed together presented a mass of color unequaled in the hall. Among the ornamental plants, the collection of Orchids and green-house plants contributed by Messrs. Pitcher and Manda, of Short Hills, was noteworthy. A magnificent specimen *Latania Borbonica* from Mrs. Francis B. Hayes was conspicuous in the upper hall. Mr. L. W. Goodell made an attractive exhibit of Nymphæas and other water plants, and a fine specimen of Nepenthes with twenty pitchers was sent by George McWilliam, gardener to Mrs. J. Lasell. A great group of green-house plants from Mr. Nathaniel T. Kidder contained the six specimens for which the prize was given to his gardener, William J. Martin. Thomas Clark, gardener to Mr. Brooks, showed, among other fine plants, a *Cibotium princeps* which took the first prize for a Tree Fern, and A. J. Wheeler, gardener to Mr. J. H. White, contributed an admirable collection, including an Acalypha of remarkable color. A collection of native flowers from Mrs. P. D. Richards was one of the most interesting features of the display, and Mr. James F. C. Hyde sent thirty-eight varieties of cultivated native Asters, two of them cross-bred seedlings, and a large and finely colored *Gentiana Andrewsii*, which he had cultivated. An instructive collection of plants, ornamental and useful, came from the Harvard Botanical Gardens, including specimens of the Olive, Logwood, Coffee, Pepper, Papyrus, Cinnamon, Mahogany and many more. The value of this collection was greatly increased by the complete and accurate labeling of the plants. Among cut flowers, the new Rose, Madame Watteville, was shown by Norton Brothers, some of the best new Cannas and tuberous-rooted Begonias by Edwin Fewkes & Son, and well-grown Dahlias by Edwin Sheppard, John Parker and George S. Tuttle.